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ANOMALOUS REACTION-TIMES IN A CASE OF  
MANIC-DEPRESSIVE DEPRESSION.<sup>1</sup>

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In the course of a series of experiments upon the condition of the nervous system in manic-depressive insanity, it was found that the reaction times of a depressed and retarded patient not only were much longer than the normal, but that on certain days there was a tendency for the simple reactions to be greatly prolonged, without a corresponding lengthening of the choice reaction time. Sometimes the time of the simple reactions was found to be equal to, sometimes to be longer than the choice reaction time. These results, so peculiar and at the same time so interesting, warrant a special report apart from the other results which do not show such anomalous results.

The subject of the experiments is a man, sixty-six years old, successful in business and of good education. He was admitted to the hospital greatly depressed and retarded in October, 1903, and the experiments to be reported were made September to December, 1904. Previous to his present illness the patient had had six similar attacks, from each of which he had recovered in a few months. The current attack (the seventh) is the longest, and at the present writing recovery has not yet taken place (June, 1905).

In the depressed phase of manic-depressive insanity there is a lowering of feeling tone and a decrease, often a slowing of voluntary bodily and mental activity, *i. e.*, a psycho-motor retardation. In this condition, in addition to the usual feeling of malaise and to the self-accusation, there is noted a feeling of inadequacy,—a feeling of inability to do what had formerly been easily performed, and, particularly, a feeling of inability to start ordinary acts. A patient may make

<sup>1</sup>This number has been prepared under the editorial care of Dr. Adolf Meyer.

few voluntary movements, and those that are made are very slow. He will sit or stand in one place for hours at a time, and, when compelled to move, will do so apparently with the greatest effort. He will talk little, and slowly, usually very short phrases, affirmative, negative or complaining. Sometimes there is a tendency to stereotypy, a repetition of the same phrase over and over again, whenever a question is asked: 'I don't know,' 'I'm not feeling well,' etc. These stereotyped expressions and the affirmative and negative answers are very often quickly given, indicating that there is no retardation for responses of that character. At times there is a slowing of mental processes which parallels or supercedes the motor difficulty.

When admitted to the hospital, the patient, the subject of the experiments, was almost immobile, kept in his bed, and made only gross movements of his arms and legs. During this time he had to be tube fed. Gradually this immobility passed away, but there remained a lesser amount of retardation. He walked slowly and very little, stood or sat in one place for hours, did not read, and did not take any interest in things about him. At the time the experiments were begun the patient's condition was as described. He said nothing voluntarily, answered slowly and in whispers, walked, dressed and ate accurately but sluggishly. As the experiments proceeded improvement was noted in reading, speaking, and walking. This progress, it should be mentioned, was observed only when he was in the laboratory; on the ward there was no appreciable change beyond an occasional improvement in speech. There is no mental deterioration apart from the depression and retardation.

The experiments to be reported are the times of simple and choice reactions to sound. The stimulus for the simple reactions was the sound given by a telegraph sounder operated electrically, and the reacting movement was the lifting of the finger (right hand) from a telegraph key. For the choice reactions, the same sound was reacted to by the same movement, and a finger of the left hand reacted to a low sound. In the choice reactions only the reaction times given for the loud sound (right hand) have been considered. Thus, the choice and simple reactions are directly comparable. The fact that the reactions of the left hand were not being considered was not known by the subject. The time was measured by means of a Hipp chronoscope, regulated by a fall hammer. The experiments were made each day at about the same time. At most of the sessions a number of simple reactions was first made, then an equal number of choice reactions (counting only those from the right hand, of course), and finally an

equal number of simple reactions. Occasionally the number of choice reactions equaled the number of simple ones. In the following tables the average and the average variation are given for the total number of reactions for the period of time considered. No reactions were discarded because they seemed to be too short or too long, but only when there was evidence that the subject had not reacted in a perfectly normal manner.

The results of the weekly grouping of the reactions are given in Table I. The general average of the 1,710 simple reactions is 273.1  $\sigma$  and of the 990 choice reactions is 334.5  $\sigma$ .<sup>1</sup> It will be noted that the simple reaction time is very greatly lengthened (although it should be mentioned that the subject's reactions were probably of a 'sensory' type), but that the choice reaction time is not correspondingly increased.<sup>2</sup> The most striking results, however, are that the differences in time between the simple reactions and the choice reactions are very slight during the ninth and thirteenth weeks. The average variations

TABLE I.

WEEKLY AVERAGES OF SIMPLE AND CHOICE REACTIONS TO SOUND.

Serial Weeks.		1	2	3	4	6	9	13
Simple Reactions.	Average.	299.0	209.2	208.3	224.0	282.9	311.5	342.8
	Av. Variation.	79.7	53.3	41.5	48.0	62.6	57.1	73.6
	No. Experiments.	120	100	100	610	100	300	380
Choice Reactions.	Average.	432.0	306.8	338.1	304.5	308.5	313.4	357.6
	Av. Variation.	82.3	71.8	75.2	55.8	47.1	48.5	24.7
	No. Experiments.	60	50	50	330	50	240	210
Choice minus Simple Reaction.		133.0	97.6	129.8	80.5	25.6	1.9	14.8

are mostly comparatively greater than normal. It was to be expected, as is found to be the case, that both simple and choice reactions during the first week should be greater than with practiced subjects, although the patient had been practiced on the reaction movements for some days

<sup>1</sup> Throughout this paper all figures will be given in thousandths of a second, i. e.,  $\sigma = .001$  sec.

<sup>2</sup> Eight normal observers gave average simple reaction times from 120  $\sigma$  to 180  $\sigma$  (Wundt, *Physiol. Psychol.*, III., 416). Tischer, in experiments upon choice reactions, similar to those made on my subject, obtained an average of 316  $\sigma$ ; the individual averages of his nine subjects varied from 293  $\sigma$  to 357  $\sigma$  (Wundt, *op. cit.*, III., 461).

before any time measurements were made. The decrease during the next three weeks was expected also. After an intermission of a week we find an increase, and still greater increases after other intermissions of two and three weeks.

The foregoing table gives only an indication of the abnormal reactions. It shows that the average simple reaction time is greatly lengthened during the sixth, ninth, and thirteenth weeks, but by weekly groupings the greatest abnormalities in the simple reactions are not shown. It is necessary, therefore, to consider the daily averages during this period and to examine in detail the results obtained on particular days. The daily averages for the last three weeks are given in Table II. The average variations have been determined for the total number of reactions on the separate days.

TABLE II.

DAILY AVERAGES OF REACTION TIMES, 6TH, 9TH AND 13TH WEEKS.

The days on which the simple reaction time was found greater than the choice reactions are designated by \*.

Date.	Simple Reactions.			Choice Reactions.		
	Average.	Average Variations.	No. Experiments.	Average.	Average Variations.	No. Experiments.
Oct. 10*	312.9	94.3	20	266.1	34.5	10
11*	342.5	41.2	20	318.1	44.5	10
12	234.0	23.7	20	273.6	45.4	10
13	269.5	52.9	20	335.6	23.5	10
14	255.8	37.4	20	349.1	57.3	10
Oct. 31	365.3	79.3	60	372.3	38.8	30
Nov. 1	277.5	46.6	60	292.1	43.1	60
2*	321.3	50.6	60	294.4	46.9	60
3	291.9	39.3	60	302.0	36.9	60
4	298.2	48.1	60	358.9	44.8	30
Nov. 28	360.4	96.2	100	361.3	36.0	30
29	340.3	82.1	100	388.5	46.0	30
30	324.9	54.9	60	350.4	46.7	60
Dec. 1*	346.6	62.5	60	345.8	40.4	60
2	331.6	46.2	60	383.6	36.3	30

The average simple reaction exceeds the average choice reaction on four days (October 10 and 11, November 2, and December 1). On only six of the fifteen days was the average simple reaction less than the choice reaction minus its average variation. If from the choice reaction is taken its variation, and to the simple reaction is added its variation, we find the figures overlapping throughout this period. Moreover, we observe that the amount of the average

variation is, as a rule, either absolutely or relatively greater for the simple reactions than for the choice reactions. In some, probably in most cases, the greater variation is due to the fact that there are two different types of simple reaction on the same day. This is brought out more clearly in Table III. in which the reactions have

TABLE III.

## ANALYSES OF CERTAIN DAILY AVERAGES.

The averages are given in large type, the average variations of the averages of groups of ten are given in smaller type and the total numbers of reactions are in parentheses.

Sequence of Tests.	Simple Reactions.	Choice Reactions.	Simple Reactions.	Choice Reactions.	Simple Reactions.
Sept. 28.	255.3 27.7 (50)	251.9 21.9 (60)	174.6 13.3 (60)	—	—
Oct. 10.	222.1 — (10)	266.1 — (10)	403.7 — (10)	—	—
Oct. 31.	330.0 42.9 (30)	372.3 1.2 (30)	400.7 49.9 (30)	—	—
Nov. 2.	—	303.7 31.0 (30)	331.7 27.1 (30)	281.8 8.8 (30)	310.9 11.0 (30)
Nov. 28.	245.2 23.2 (30)	361.3 22.8 (30)	409.7 31.3 (70)	—	—
Dec. 1.	300.6 14.7 (30)	337.5 8.1 (30)	392.5 30.8 (30)	352.0 24.8 (30)	—

been grouped according to the sequence of the tests. A glance at the table will indicate what is meant. For example, September 28 — fifty simple reactions were first taken, averaging 255.8  $\sigma$ , then sixty choice reactions were made, average 251.9  $\sigma$ , and finally sixty simple reactions, average 174.6  $\sigma$ ; and October 10 — ten reactions each, in order (1) simple, (2) choice, and (3) simple, averaged respectively 222.1  $\sigma$ , 266.1  $\sigma$ , and 403.7  $\sigma$ . On other days as well as on these two days the simple reactions first made differed greatly from those made after the choice reactions, thus indicating that there are two types or methods of reaction. Further comparison of the two tables shows that the lengthened average simple reaction on any day is often due to one greatly varied set.

Before attempting to account for the anomalous condition which has been found, it is well to summarize the main results thus far given. It has been found that in a retarded subject (manic-depressive depression):

1. The average time of simple reaction to sound is greatly increased.

2. The time of the choice reactions is sometimes increased, but proportionately not so much as the time of the simple reaction.

3. From day to day great variations in the time of both simple and choice reactions are found. The simple reactions show the greater variation.

4. There is a great variation in the simple reaction time on the same day, both when all such reactions are combined and particularly when they are grouped in accordance with the experimental grouping.

5. Occasionally the daily average simple reaction time is greater than the average choice reaction time.

6. More often the average of the group of simple reactions taken before or the average of the group taken after the choice reactions alone shows this peculiar condition.

Two possible explanations of the foregoing phenomena which immediately suggested themselves are (1) that the attitude of the subject, as shown by the greater or less number of premature reactions, had caused the great time difference, and (2) that during the second series of simple reactions fatigue had taken place and caused a lengthening of the simple reaction time. If the number of premature and wrong reactions in the choice experiments had been increased on certain days, and if on those days there had been a shortening of the choice reaction time, we should need to seek no further for an explanation of the condition. Such, however, is not the case. Table IV. gives the number of the premature and wrong reactions for each week

TABLE IV.

## PREMATURE AND WRONG REACTIONS.

*p* = premature. *w* = wrong. Number of experiments in parentheses.

Serial Weeks.	Simple Reactions.	Choice Reactions.
1	12 <i>p</i> (120)	3 <i>p</i> , 3 <i>w</i> (60)
2	6 <i>p</i> (100)	1 <i>p</i> , 4 <i>w</i> (50)
3	2 <i>p</i> (100)	3 <i>w</i> (50)
4	20 <i>p</i> (610)	5 <i>w</i> (330)
6	2 <i>p</i> (100)	3 <i>w</i> (50)
9	— (300)	1 <i>w</i> (240)
13	1 <i>p</i> (380)	1 <i>p</i> , 4 <i>w</i> (210)



of the series for both simple and choice experiments. After the first week, the number of premature reactions is no greater than is found with normal subjects. It is evident, therefore, that the attitude of expectation (as shown by the premature reactions) with its easily liberated motor response cannot be considered the cause of the shortened choice reactions, and the absence of this mood cannot be thought to be the reason for the lengthened simple reactions.

The other suggested explanation, viz., fatigue, is not more tenable. Some of the results point in that direction, while others give opposite indications. On October 10 the first set of ten simple reactions averaged 222.1  $\sigma$ , the ten choice reactions 266.1  $\sigma$ , and the final ten simple reactions 403.7  $\sigma$  (see Table III.). Similar averages were found on October 31 and November 28, which suggest a fatigue effect, but the reactions on other days give strikingly opposite results. This is notably the case on September 28 and November 2. Another example of this is not given in Table III., the results on November 1. On that day the first thirty simple reactions averaged 288  $\sigma$ , then an equal number of choice reactions 307.3  $\sigma$ , and the same numbers of simple and choice reactions respectively 266.9  $\sigma$  and 275.8  $\sigma$ . With as many, if not more, cases against as for the hypothesis of fatigue, it cannot be seriously considered.

It is possible that in this case we have simple reactions similar to the antagonistic reactions noted by Smith<sup>1</sup> and later studied by Judd, McAllister and Steele.<sup>2</sup> Smith has recorded the fact that 'the reaction movement may be complicated by a preliminary antagonistic movement and that the time taken up in this movement is on the average probably between four and five hundredths of a second.' A psychophysical explanation for this is suggested by Smith,<sup>3</sup> viz., that the attention is directed to holding down the key before the stimulus is given, and the shock of the sound or light, as the case may be, causes an intensification of the muscular contractions, 'an increase in the innervation of the muscles which are already in a state of tension.' Smith has observed such a condition in patients suffering with general paralysis. "It is, further, possible that the phenomena of antagonism have certain relations, in some individuals, to the alternation of impulses of which we are conscious in deliberation, hesitation and doubt." If elaborated more, this hypothesis would account for all the facts

<sup>1</sup> W. H. Smith, 'Antagonistic Reactions,' *Mind*, N. S., XII., 1903, 47-58.

<sup>2</sup> C. H. Judd, C. N. McAllister and W. M. Steele, 'Analysis of Reaction Movements,' *Yale Psychological Studies*, N. S., Vol. I., 1905, 141-184. PSYCHOLOGICAL REVIEW Monograph Supplement, No. 29.

<sup>3</sup> *Op. cit.*, p. 58.

which have been recorded by me. To begin with, it should be stated that I have observed in my subject actions similar to those of a general paralytic recorded by Smith, but the extra pressure of the reaction key before the reacting movement was not a constant phenomenon. However, great variability was noted in the experiments made at the Yale laboratory and also in those made by Smith. Assuming for the present Smith's interpretation of the simple reaction increase, we need to account for the more normal character of the choice reaction. This may be explained, though rather weakly, perhaps, as an inability to concentrate on the four factors present in the choice experiments, two sounds and two movements. Thus, the scattering of the attention would prevent any increased muscular innervation in these tests, whereas on the other hand when only one sensory-motor set of things had to be considered, the concentration of the attention permitted, and, possibly, caused the intensification of the muscular contraction preceding the reaction movement.

This explanation is not very satisfactory because it must consider these facts apart from others, which are of the same character, in this class of patients. A few of these facts are here given. It has been mentioned that these patients answer slowly (*i. e.*, slow association reaction), but will say 'yes' or 'no' quickly (more rapid association reaction). These simple affirmative and negative answers are, however, normally paths of very little resistance, although they are associative responses. To pin pricks there is often little or no response, but they are usually perceived and appreciated. It seems to me that in all these conditions we have to deal most probably with some sort of decrease in irritability of the body. Whether this lowered irritability be central or peripheral or general, I cannot at present say. The feelings of lassitude and of initiative inability are easily understood from this standpoint, and the so-called sensory complex, a condition in which the patient has a feeling of unreality, particularly of the body or its parts, is also intelligible.

At present, more than this we cannot say. It is possible that further consideration of the other experiments made upon this subject and upon similarly retarded patients may bring to light new facts that will help toward a clearer understanding of the general subject of retardation as well as of this particular condition.



A REVIEW OF SOME RECENT PAPERS UPON THE  
LOSS OF THE FEELING OF REALITY AND  
KINDRED SYMPTOMS.

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Although the symptoms which may be comprised under this heading are by no means infrequent in psychasthenic states and in various psychoses, they have received relatively little attention until quite recent years. In the textbooks on psychiatry with the exception of that of Wernicke, whose work is a perfect mine for everyone who wishes to study abnormal mental manifestations, they are scarcely mentioned or are buried, often to such a degree as to be almost unrecognizable, in the general account of hypochondriacal delusions. And yet the French literature contains a number of early studies, *e. g.*, the report of Krieshaber<sup>1</sup> and some articles of Cotard.<sup>2</sup>

Recently a number of studies have appeared which deal at some length with these symptoms. What is common to all the cases reported is the loss of the feeling of reality within one or another field of experience, either that relating to the outside world or to the body, or to the individual's own activities or thoughts.<sup>3</sup> All these symptoms are present in spite of the fact that there exists neither a real sensory defect (some exceptions will be noted later) nor any agnosia.

We will briefly consider the cases recently reported. The patient of Foerster<sup>4</sup> complained of being unable to feel the various parts of her body. This extended not only to the limbs, trunk, and head, but, when speaking of the respective sensations of sight, hearing, and taste, she said she could not feel her eyes, ears, or tongue. She claimed

<sup>1</sup> Krieshaber, quoted by Störing in his *Vorlesungen über Psychopathologie*, 1900, p. 286, and by James, *Principles of Psychology*, Vol. I., p. 377.

<sup>2</sup> Cotard: 'Du délire des négations,' and 'Perte de la vision mentale dans la mélancolie anxieuse,' *Etudes sur les Maladies Cérébrales et Mentales*, Paris, 1891.

<sup>3</sup> Wernicke has for the sake of simplicity introduced into psychiatry special terms for these sets of experiences and speaks of the *allospyche*, *somatopsyché*, and *autopsyché*.

<sup>4</sup> Foerster, 'Ein Fall von elementarer allgemeiner Somatopsychose (Afunktion der Somatopsyché),' *Monatsschrift für Psychiatrie und Neurologie*, Vol. XIV., p. 189.

that when lying in bed she did not know what position she was in. When the wind blew upon her face or she was touched, the parts thus influenced became more real.<sup>1</sup> In regard to the outside world she said that she could not recognize anything, that the eyes did not reach out, that everything looked veiled, that she could not hear clearly, that she could not 'take in' odors, that the food did not taste as it used to, touch seemed dull, pain 'not as it used to be.' She had the same sense of unreality when she was asked to name objects by handling them. In regard to her own mental processes she said that she had 'no thoughts' and that she was unable to represent any impressions to herself. "While I look at a thing I know how it looks, when I close my eyes it is gone."<sup>2</sup> As is very common, especially in milder cases, this patient had a feeling of indifference towards everything. At the height of the disorder she expressed a very decided loss of the feeling of self (depersonalization). In addition she presented an inactivity and a state of depression, perplexity and fear.

It will be seen that this case resembles in many ways that of Krieshaber. K.'s patient also spoke of his body as non-existing, said that things looked far away, that his ears seemed stopped up, and that he felt as if he were a different being. This man, however, also showed a symptom which seems to be rare, but which I have been able to observe in a very grave case of this sort. To him things looked flat, had no relief. I may add that in my case this was associated with fleeting errors in estimating distances. K.'s case showed also a loss of the feeling of activity.

An interesting and graver case has been reported by Alter.<sup>3</sup> The patient not only complained that his body was not real but that it constantly changed, 'the moment I change my position the body changes.' He spoke of it as being in particles, not put together right, etc. The external world was unreal and moreover changed. "Every time I look at things they are changed; I constantly get into different relations with my surroundings." And he spoke, for example, of the house as being mixed up, the corridor wrongly attached, or when

<sup>1</sup> In some cases of my own the very opposite took place; touching or rubbing precipitated the feeling of unreality for the parts of the body in question.

<sup>2</sup> The feeling of unreality in regard to one's own mental processes may be very marked. I have the notes of a patient who said that at no time did any thoughts come into her mind, and that her mind only had a content when someone talked to her, 'when the person goes, the thoughts go.' Another patient claimed that she only had thoughts in her mind so long as she spoke.

<sup>3</sup> Alter, 'Ueber eine seltenere Form geistiger Störung,' *Monatsschrift für Psychiatrie und Neurologie*, Vol. XIV., p. 246.

he returned from a walk he said on one occasion: 'It seems as if I had been away for eternity, things look so different.' He also had an absence of the feeling of activity for his own actions, but not a sense of unreality in regard to his thoughts. Evidently as the result of this feeling of change produced by every movement, he sometimes lay motionless in forced positions, resisting every interference (a condition occasionally observed in such patients, but to be sharply differentiated from other, though superficially similar, states of akinesis). On some occasions he went so far as to definitely deny the identity of objects. This trait may be very much more marked in some cases; it was first described by Cotard under the term of *délire de négation*.

In a patient of Pick<sup>1</sup> the depersonalization was very marked. She complained that she had 'no consciousness,' that she did not know herself, that she was 'not alive,' and in the foreground was an absence of the feeling of activity. "It is not I who thinks or acts." She also said: 'I have no memory.' Aside from this there was no decided expression of unreality of the body, but the external world appeared strange. She said she saw things 'far away,' '*erstarrt*,' 'the vision is cut off.' She complained of absence of hunger. She was depressed and said she felt no interest in anything.

Juliusberger<sup>2</sup> reports a milder case who complained that things looked strange and lifeless. She appeared strange to herself, and her own writing and voice seemed strange to her. She said she was unable to represent to herself how things looked or tasted, that she could not realize the flight of time, that she felt indifferent, and for a time she claimed that her sense of hunger and thirst were absent.

This entire symptom complex, although scarcely in its gravest form, is evidently well known to Janet, and in his recent works<sup>3</sup> much may be found on the subject. He gave a brief review of this work at a recent visit to this country.<sup>4</sup> In this article he speaks, *e. g.*, of an epileptic who had a transient attack in which he had an abnormal feeling about the reality of the visible world, and doubt about the existence of things, a state which was associated with *aboulia*. Another case which resembled that of Pick said 'It is not I who eats, speaks, works,' 'I lack something to give me real existence.'

<sup>1</sup> Pick, 'Zur Pathologie des Ich-Bewusstseins,' *Archiv für Psychiatrie*, Vol. 38, p. 22.

<sup>2</sup> Juliusberger, 'Ueber Pseudomelancholie,' *Monatsschrift für Psych. und Neurol.*, January, 1905.

<sup>3</sup> Janet, *Névroses et Idées Fixes*, Paris, 1898; *Les Obsessions et la Psychasthénie*, Paris, 1903.

<sup>4</sup> Janet, 'The Psycholeptic Crises,' *Boston Medical and Surgical Jour.* January 26, 1905.

She also claimed that she could not remember anything. There was no definite feeling of unreality in regard to her body, and the abnormal feelings associated with the recognition of the outside world were only indicated. "It is dull before my eyes." This patient also said that she had lost all idea of time. But Janet also relates a case in which the body especially appeared altered to the patient. She had attacks in which she felt that she grew smaller and totally different. At one time she stopped eating because her mouth was 'gone.' Again her hands and feet seemed to her no longer to be a part of herself, 'a dream hand.' She said that things seemed to be done, to be seen and touched, not to be lived with. She also complained of lack of interest.

The objective examinations which were made of these various cases revealed very little. The acuteness of the various sensations was never altered, except in the case of Alter, who found a unilateral diminution for the appreciation of roughness in his case, a symptom which he attributes to hysteria. I myself found on one day with very careful examination a slight difference in touch sensation on the two legs. Various investigators have found the field of vision normal, the color perception intact. Foerster examined into the visual memory; he found it normal. It may here be added that in general the memory is not interfered with even in the cases who claim that they cannot remember, just as there is no real slowness in thinking when the patients claim they have no thoughts. Foerster found the ability to localize skin impressions to be normal. Janet, who made extensive and very careful tests in his cases, found no disorder of cutaneous, muscle, or visceral sensibility, but a certain disposition on the part of the patient to 'neglect agreeable or painful impressions.' I have repeatedly noted that patients who subjectively complain of lack of interest state that pinpricks do not seem so sharp as normally, though there is no objectively demonstrable diminution of pain sensation. Of interest are the results of Alter. The examination of various kinds of sensation gave at times perfectly normal results; again, at the same interview, anæsthesias or analgesias were found, especially when the attention was drawn to these sensations. Sometimes passive motions were correctly recognized and correctly imitated with the corresponding limb, again both were very poor. Sometimes cutaneous sensations were correctly localized, again very poorly. In a similar case of my own I found fleeting inability to localize cutaneous impressions and to recognize passive motions. It was in this same patient that, as I have indicated above, fleeting disorders of estimating distances by sight were noted. The impression left was that the perplexity alone did

not explain these disorders. While, then, it is impossible to demonstrate objectively any sensory disorders, it may nevertheless be the case that fleeting changes may be present in grave cases in which the somatopsychic alterations are the most marked, but further studies are needed.

As to the explanation of these phenomena, it is scarcely possible to come to any definite conclusions as yet. Pick, who in his first paper<sup>1</sup> called attention to the same transient states in epileptics as Janet reports, simply spoke of alterations in the feeling of recognition (the *Bekanntheitsgefühl* of Volkelt). Janet, who calls these phenomena psycholeptic crises, is inclined to oppose what he calls the simple explanation, that in some way these symptoms have something to do with disorders of organic sensations, because his careful search for alteration in this direction revealed nothing. What he regards as the common factor in these cases is a peculiar sense of incompleteness (*sentiment d'incomplétude*) in regard to perceptions, emotions, and actions, 'the mind does not carry out its processes to their normal completion.' He assumes that mental operations can manifest themselves in two different ways. They may bear 'upon abstract ideas, general ideas, imaginary conceptions and representations, and even upon the reproduction of past events.' On the other hand they may 'bear upon events which are present and real and produce a knowledge of complex events which are actually taking place in the universe at the moment; also where they produce reactions in us which are likewise perfectly real acts, that is to say, acts capable of determining modifications in the world as it exists.' While ordinarily these two sets of phenomena are regarded as identical, Janet claims that they differ in complexity and in the nervous tension which they require, the former requiring less tension, because they represent merely repetitions or syntheses, previously achieved, and because they deal with abstract elements, few in number and extremely simplified, the latter requiring greater tension because new syntheses and complex elements are constantly required and a constant adaptation to new situations. He concludes, therefore, that a lowering of cerebral activity would explain these phenomena. It should be added that Janet regards this merely as an hypothesis and urges that most stress be laid on the observation of facts. Whatever one might say about this hypothesis, it is not clear how it could explain the somatopsychic part of the symptom complex which is sometimes the most prominent feature. The fact that the most habitual sensations, those which inform us about the

<sup>1</sup> Pick, 'Zur Pathologie des Bekanntheitsgefühls (Bekanntheitsqualität),' *Neurologisches Centralblatt*, 1903, Vol. XXII., p. 2.



various parts of our body, are no longer correctly valued (sometimes only parts of the body are thus excluded from correct valuation) is certainly not in accord with such an hypothesis.

Foerster, Alter and Juliusberger stand in their explanations on the ground of Wernicke and above all of Storch.<sup>1</sup> S. claims that the feeling of the reality of external objects and the projection into space depend upon the association of muscle sensations with sense perceptions. Foerster, therefore, thinks that the change is to be found primarily in a disorder of the consciousness of the body, an insufficient valuation of organic sensations, and secondarily in a disorder of the consciousness of the external world. The fact that his patient had a feeling of unreality about her own ideas he explained on the ground that these consist of memories of sense impressions and organic sensations. There is no doubt but that this explanation has much in its favor. Above all, it takes into account the frequent association of the somatopsychic and allopsychic changes, and it would also be in harmony with the fact that these symptoms present a close relation to emotional changes which latter may both succeed or precede (see below) them. Janet's claim that we find no real demonstrable disorders of organic sensations, even if it should prove to be absolutely correct, would be no argument against such an hypothesis, since such changes would have to be regarded like the agnosias as association disorders, and not as anæsthesias.

I shall refrain from going into the clinical side of these disorders; it may only be mentioned that according to Janet and Pick they occur frequently in epilepsy; according to Janet and Storch in psychasthenic and neurasthenic conditions. According to Janet they often form the basis upon which phobias and compulsive thinking arise. Storch states that they occur often in melancholia. In my experience they may be found in the various forms of depression, especially in the so-called involution melancholias; also in the depressions of manic depressive insanity where they may vitiate the prognosis; they may occur in the depressions of dementia præcox and general paralysis, though they may sometimes appear as independent affections. In general it may be said that they seem to be closely related to the depressive symptom complex (especially in its apprehensive form) not only in the sense that depression and apprehension follow them, but also in sense that the symptom complex here discussed may precede (or in manic depressive insanity replace) the melancholic syndrome.

<sup>1</sup> Storch, 'Muskelfunction und Bewusstsein,' *Grenzfragen des Nerven- und Seelenlebens*, No. X., Wiesbaden, J. F. Bergmann, 1901.

After I had sent off the foregoing review two articles have appeared which deal with the same subject, and it may be of interest to add these here.

The first article is by Deny and Camus ('Sur une forme d'hypochondrie aberrante due à la perte de la conscience du corps,' *Revue Neurologique*, May 15, 1905). The authors report a case with very pronounced abnormalities who had had similar attacks before. The present one developed after a brief period of confusion. The feeling of unreality was very extensive. The patient complained that the whole body was changed. This extended to the various parts, the limbs, trunk, and head, and she often said she felt as if the body no longer existed, and that when lying in bed she could not feel where the limbs were except when she rubbed them. She had no feeling of hunger but much thirst, yet after drinking she felt as if she had not taken anything. She claimed that after she closed her mouth she did not know where her tongue was. When waking up in the morning she said she did not know how the night had passed (I have observed a few times that such people claim that their sleep is different from what it used to be, that it is not real sleep). In regard to the outside world she felt that everything looked unreal, that hearing was different, smell, taste, touch lost: 'When I touch an object it is as if it were not I.' She said she was unable mentally to represent anything to herself. About her own acts she said, 'I do not feel it when I do anything,' and in general, 'I do not feel myself as before.' She complained of lack of affection towards her people, and of utter indifference. The general condition was one of agitation and depression. Like all other patients, she remained clear. Objectively no disorder of sensation could be demonstrated with the exception of a diminished pain appreciation, which as we have seen above is not uncommon. The authors decline, as we have done, to accept the hypothesis of Janet, and are in favor of that advanced by Storch and his followers.

The other article is a second contribution by Juliusberger.<sup>1</sup> J. reports briefly a case in which the feeling of unreality extended chiefly to the autopsychic activities, *i. e.*, to her own thoughts. But she also claimed that she had two selves, that sometimes she felt the one, again the other. She spoke of one, the more positive one, as being in her heart or in her chest, where it was bound up and pined for freedom, desired to live, that it was from there that

<sup>1</sup> 'Zur Symptomatologie der Melancholie,' *Monatsschrift für Psychiatrie und Neurologie*, May, 1905.

the thoughts and desires came. The other self she said was a negative one, that it was in the head, and there observed everything like a third person, but that it had no thoughts. She also said, 'It thinks up there, but it isn't I who thinks.' Again, "I repeat word for word what I hear, but it doesn't seem to be I. \* \* \* It is as if one talked into a phonograph and it simply comes back. I don't hear, but I understand the sense." Or, she said that the thoughts had no connection with herself; or again, 'I have only a bodily feeling of myself, I have only a body.' This 'splitting of personality' J. wishes to explain by assuming a dissociation between the somatopsychic functions on the one hand, and the allo- and autopsychic on the other. He recalls Meynert and Wernicke, who regard the consciousness of the body, *i. e.*, the sum total of all organic sensations, as the 'primary self' which stands as an ever constant complex against the other contents of consciousness. In his further discussion J. tries to show that in reality the somatopsyche, the consciousness of self, and the conscious will are one and the same, and claims that while sensations and perceptions represent the becoming conscious of the completed reaction toward stimuli, the actual process, the activity of the nervous system itself, also becomes conscious as feeling of activity, this being the result of organic sensations and therefore the function of the somatopsyche.

J. finally seems to assume that the difficulty in thinking which his patient expressed in various ways is identical with the retardation of thinking so frequently found in certain states of depression with which often no feeling of unreality is associated. He is inclined to attribute this symptom to the same sort of dissociation, and he promises to show that much in the depressive syndrome will have to be explained on a somatopsychic basis. In a footnote he adds that in the manic states practically the same principles will probably hold. It is well in this connection to call attention to the fact that at the end of his former article J. suggests that it would be well to study whether or not pseudomelancholias, by which he means depressions without obvious psychomotor retardation, differ from true melancholias, that is, depressions with psychomotor retardation, in the fact that in the former the organic sensations of motion or their memory pictures remain in the 'waking consciousness,' while in the latter 'they sink at times more or less into subconsciousness.' In other words, he is inclined to attribute the retardation of motion, as well as that of thinking, both of which constitute prominent symptoms of those depressions which belong in the group of manic depressive insanity, to disorders similar

to that in the feeling of unreality sketched in the foregoing. Aside from the fact that J. brings no valid reason for this as yet, there exists much clinical evidence which seems to speak against such a view. Altogether it would seem wise not to generalize too soon in a field in which we still know comparatively little, a danger which Alter also has not avoided. However, in regard to J.'s point it is well to suspend judgment until we know what he has to say in the future article which he promises.

## PSYCHOLOGICAL LITERATURE.

### NORMAL AND ABNORMAL ASSOCIATION.

*Diagnostische Assoziationsstudien. I. Beitrag. Experimentelle Untersuchungen über Assoziationen Gesunder.* C. J. JUNG and FR. RIKLIN. *Journal f. Psychologie u. Neurologie*, Vol. III., pp. 55-83, 145-164, 193-214, 283-308, and Vol. IV., pp. 24-67, with a preface by Professor BLEULER, Vol. III., pp. 49-54.

This remarkable piece of work and its continuations are no doubt the best single contribution to psychopathology during the past year. The difficulty in obtaining valuable data of sufficiently wide applicability from a study of sensations, of feelings, of memory, of will, leads to the study of associations as the fundamental phenomenon of psychic activity. As the type of association which would lead to most valuable results, the writers found that obtained with perfectly free scope and elimination of all aim-concepts. Strings of associations are too apt to lead to useless enumerations of coördinations and coëxistences.

The writers used a list of 400 words of 1-3 syllables, 231 nouns, 69 adjectives, 82 verbs and 18 adverbs and numbers, as simple as possible, chosen from every-day life and intermingled so as to avoid adjustment to any special reaction type. The word was spoken and the subject was instructed to utter the first word that would present itself. The time was measured with a stop-watch, from the chief syllable of the test-word to the reaction. Quite a few of the uneducated subjects had to be trained to really give the first reaction and to avoid certain special combinations or word-compounds after the fashion of certain games, and to get over a disturbing emotional stupidity or 'Schulstimmung.'

The first aim was the collection of a large material from normal individuals to determine whether there are any general rules in the reaction and any special reaction-types. Moreover, 'since attention is that delicate affective apparatus which first reacts in abnormal physical and mental conditions and modifies the results,' it was subjected to definite experimental influences. Thus, the material presented determines the laws of variation of associations within the range of the normal, and further, which are the direct effects of attention upon the



process of association, and especially whether the intrinsic value of associations decreases as it passes from the focus of consciousness.

Two hundred reactions were taken without further conditions, and at once classified, so far as possible with the help of the subject. The results were divided into a first and a second hundred; with many uneducated subjects fatigue asserted itself and the second hundred was obtained on the succeeding day.

Another series of 100 reactions was taken with the request that the subject should pay as much attention as possible to the introspection of the process (The A-phenomenon of Cordes) and yet react as promptly as before. After each reaction the subject had to describe the sum of psychological phenomena which were immediately produced by the perception of the auditory stimulus and the result was noted. Relatively few subjects even among the educated lent themselves to this task.

A third series of 100 words was taken the next day, while the subject had to make pencil-marks, about 1 cm. long, 60 per minute for the first 50 reactions, and 100 per minute for the second 50, following the beat of a metronome. In a few persons the acceleration was made after every 25th reaction, from 60 to 72, 100, and 108 beats per minute to avoid the effects of habituation. Thus each subject yielded 300-400 associations. In six subjects tests were also made in a state of fatigue, and in one just on awaking in the morning, and in another in a state of great irritation. The whole material consists of 12,400 associations in 9 educated men and 14 educated women, and 7 uneducated men and 8 uneducated women.

For the classification, Jung starts from the fact that we really deal with word-reactions which give a merely remote and incomplete picture of the actual psychical association and connection. Especially the uneducated fail very often to suppress real chains of association while the educated succeed better in yielding to the reaction without any special constructions.

Jung and Riklin use largely empirical principles, in the main following Aschaffenburg. It is necessary to consider not only the logical connections of test and reactions but also the fact that the stimulus and the reaction both being words, the mere verbal form may determine the reaction, and the fact that, with the uneducated, with patients at least, the system should allow of an approximately correct classification even without the help of the subject, such as is hardly feasible with the schemes of Ziehen, Mayer and Orth, and Claparède.

*A. Inner association.*

*a. Coördination.*

- a.* apposition — 1. by a common denominator  
(lake — sea; cherry — apple)
- 2. by similarity  
(to spare — indulgence)
- 3. by inner relationship  
(play — youth; star — romantic)
- 4. by external relationship  
(pencil — length; sky — color)
- 5. by exemplification  
(color — sky; foreign — emigrant).
- β.* subordination — 1. specification  
(tree — beech; horse — the horse of Mr. X).
- γ.* denomination (cat — animal).
- δ.* contrast (pleasure — pain).
- ε.* coordinations not readily classified.
- b.* Predicative relations, judgments, qualities or activities include :
  - I. Noun and adjective, either as
    - a.* inner predicate (with real meaning) ;
      - 1. statement of fact,  
(snake — poisonous, glass — fragile), or
      - 2. judgment of values,  
(father — good, wood — useful)
    - b.* external, accidental or superficial predicate,  
(water — wavy, salt — granular).
  - II. Noun and verb, in
    - a.* subjective relation,
    - β.* objective relation.  
(at times difficult to differentiate from the coordination by example ; to polish — brass, is an objective relation ; to polish — shining metals, is a coordination by example).
  - III. Determinations of place, time, means and aim.  
(go — to town ; to dine — at 12 ; strike — with a stick ; wood — for fuel).
  - IV. Definition or explanation.  
(door — noun, star — celestial body).
  - c.* Causal dependence (pain — tears).
- B.* External associations — merely superficial connection.
  - a.* coexistence (ink — pen ; lamp — family ; ride — horse. Many associations with 'to write' are mere school reminiscences : pencil — write).
  - b.* identity.
    - a.* synonyms ; *β.* translations.
  - c.* verbo-motor forms.
    - a.* verbal connections acquired by practice :
      - 1. simple contrasts  
(dark — light ; like — unlike) ;
      - 2. frequent phrases  
(say — grace ; poor — church mouse).
    - β.* proverbs and quotations :  
(eye — tooth ; liberty — equality ; to be — not to be).
    - γ.* word compounds or mere change of form :

1. toe—nail, piano—player, tooth—ache, or with repetition of word: simple—simpleton, tennis—tennisball.
  2. school—scholar; find—found.
  - δ. precocious reactions (to merely the first part of the word: dark red—light, fox-glove—dog).
  - ε. interjection (love—ah).
- C. Sound reactions;
- a. Completion of words (power-ful; New-York).
  - b. Sound (apply—apple; crack—creek).
  - c. Rhyme (heart—smart; hair—fair).

Aschaffenburg divided them further into rhymes with or without sense.

D. Residual group.

- a. Indirect association, intelligible only through the assumption of some link (especially in visual types):
  - a. Presence of a simple common link:
 

red—(flower)—fragrance; hay—(grass)—green; in these reactions the link is plainly realized by the subject. They are a symptom of displacement of inferior associations which nearly reach the threshold of the reaction, according to Claparède the result of competition of several intermediate associations, each of which is too weak to be conscious, or noticed.
  - β. Shifting associations by alliteration to a suppressed link:
    1. Centrifugal:
 

hair—(blond)—blue; Liebe—(Hass)—Fass.
    2. Centripetal:
 

malt—(salt)—vinegar; rosten—(Ross)—Pferd.
- γ. Centrifugal and centripetal shifting by completion of the word, or verbo-motor association: normal—(solution)—filter; rat—(poison)—poisonous; Engel—(hard)—heart.
- δ. Shifting through several links: ink—(red—li'mus)—acid.

All these reactions are closely connected with changes of attention.

- b. Senseless reactions—(words without any connection, may be perseverations).
- c. Lapses (absence of reactions) occur most frequently with words which touch upon certain emotions or emotional undercurrents. They are evidence of more or less profound perplexity. In the series of test-words they should be distributed evenly so as not to vitiate the comparison of the first, second or further hundred of reactions.
- d. Repetition of the word (not including the occasional habit of repeating questions—usually an emotional phenomenon).

In addition to this analysis, the writers tabulate a number of special phenomena.

- A. Perseveration—the sticking to a word or to a complex: melt—hot, followed by slow—fire; cover—box, followed by rat—basket.

- B. Egocentric reactions: direct self-reference in: praise—for me; dance—I won't; or subjective appreciation in: idle—pleasant; piano—awful. They seem to be more frequent among men, less for personal desires, than in personal or subjective judgments.
- C. Number of repetitions of the same word as a reply.
- D. Verbal determination, the frequency of which is of special importance in certain abnormal states.
  - a. Use of the same grammatical form (nouns and nouns; adjectives and adjectives).
  - b. Identity of number of syllables (to estimate the influence of rhythm).
  - c. Phonetic coincidence.
    - 1. consonance—frequency of agreement of the vowel of the first syllable of the two words;
    - 2. alliteration—also in the first syllable;
    - 3. equal termination.

There is no doubt about the necessity of getting abundant experience in controllable healthy individuals before any such method can be profitably applied to patients. The detailed and full account goes a long way to familiarize the reader with the method of the authors. As an illustration of the final result of the summing up, the table of the experiments with a highly educated man of 28 is given.

In a brief summary in the *Centralblatt f. Nervenheilkunde u. Psychiatrie*, Vol. 27, pp. 556 to 557, August 15, 1904, Jung gives a few of the principal results in the following manner:

- 1. The educated have on the whole more external associations than the uneducated, consequently
- 2. The reaction time of the uneducated is a little longer than that of the educated (because they are less able to suppress special efforts at construction).
- 3. The principal source of the changes in the field of association is the changeable condition of attention.
- 4. The relaxation of attention causes especially a plain increase of all the inferior forms of association (merely verbal connections, additions to words, and sound associations). On the contrary an increase of attention leads, as a rule, to an increase of inner or intrinsic associations.
- 5. All psychic disorders which are especially marked by a deficiency of concentration show, therefore, an increased tendency to external and sound associations. This finding was corroborated by experiments with reduction of attention by being bored, by fatigue, or exhaustion in the sense of Aschaffenburg, by a recently experienced profound affect (in which the attention of the subject was inwardly directed to the persevering affect), certain forms of neurasthenia, of

Special Quality.	Normal.		Distraction.			Fatigue.	Sleepiness.	
	1st Hundred.	2d Hundred.	Internal.	External.			1st Part.	2d Part.
				1st Part.	2d Part.			
Coördination.....	9	13	4	10	12	10.2	2	—
Predicate.....	6	16	19	10	4	10.2	5	2
Causal relation .....	—	—	—	—	—	—	—	1
Coexistence.....	18	5	6	8	4	14.1	14	6
Identity.....	6	8	5	10	2	2.5	5	2
Verbo-motor type.....	54	52	56	46	54	53.8	40	51
Completion of word.....	1	—	8	4	12	2.5	2	2
Sound.....	—	—	2	6	2	—	4	5
Rhyme.....	4	4	1	2	8	2.5	20	21
Indirect.....	2	2	1	2	4	—	2	2
Senseless.....	—	—	—	2	—	3.8	—	—
Lapse.....	—	—	—	—	—	—	—	—
Repetition of word.....	—	—	—	—	—	—	—	—
Egocentric reaction .....	1	—	3	—	—	—	—	—
Perseveration.....	—	—	2	2	—	2	4	—
Recurrence.....	5	5	2	6	2	6	9	2
Equal grammatical form.....	73	47	47	54	46	63	59	60
Equal number of syllables...	53	45	49	46	42	44	61	58
Alliteration.....	7	6	5	10	4	4	17	9
Consonance.....	15	23	16	24	20	5	32	36
Equal termination.....	19	15	9	18	18	14	33	36
Inner associations.....	15	29	23	20	16	20.4	7	3
External associations .....	78	65	67	64	60	70.4	59	59
Sound reactions.....	5	4	11	12	22	5	27	32
Number of associations.....	100	100	100	50	50	78	78	78

(In the tabulation of the results with patients, it is obviously unnecessary to make all the above discriminations unless there should arise special indications. The points of differential importance will be brought out in the reviews of studies with the imbecile, epileptic, hysterical, manic-depressive, etc.)

senile dementia, of progressive paralysis, and by the flight of ideas of various origin.

6. The cause of sound associations in manic flight is the disorder of attention and not the motor excitation as Aschaffenburg thought.

7. By artificial reduction (splitting) of attention, a mode of association is produced which cannot be differentiated on the surface from that of flight of ideas, of fatigue, of acute alcoholism, etc. (marked



tendency to external and sound association). Actual motor excitation was completely excluded by the arrangement of the experiment.

This brief summary by Jung hardly does justice to the numerous hints in the discussion of individual persons and in the differentiation of reaction types. To the brief notes inserted in the review of the analytical classification I add here:

While, among women, the inner associations are numerous and even larger in the second hundred, there is certainly an increase in predicative connections, and it would seem that with the increase of (verbo-motor) sound reactions and of residual types, there is a decrease of the congruity of grammatical form.

Prevalence of egocentric reaction is probably connected with a tendency towards perseveration, especially when there are reactions of marked emotional tone.

Men have nearly twice as many indirect associations as women, also a higher average of egocentric reactions, especially in the form of judgments (with a fairly parallel number of perseverations) and a slightly greater number of sound reactions.

The less educated (attendants) with their greater feeling of duty of attention showed more frequent correspondence of grammatical form and number of syllables between the two words, fewer senseless reactions, a greater number of coordinations, coexistences, only half as many egocentric reactions, only one seventh of the number of sound-reactions of the highly educated. Hence the above conclusion concerning the importance of attention. The word is apt to have the meaning of a question to them.

Individual dispositions assert themselves in two well characterized types:

1. A type with frequent use of subjective, frequently emotionally accentuated reactions (personal memories);
2. A type with more objective impersonal reactions.

In the first type, Jung and Riklin distinguish three groups of preponderant traits:

(a) A type which is apt to be reminded of some constellation or complex of distinct emotional value; the emotional color of the first word rouses the memory of the complex and influences the reaction, *e. g.*, by the desire not to betray a secret undercurrent: complex constellation type. Even in persons with great self-control, the existence of such complexes is apt to be betrayed by prolongation of the reaction-time, unusual construction (in the form of a sentence, frequent use of the definite article, etc.), by repeated and not otherwise accounted for

superficial associations to similar words (phenomenon of absorption of attention by the complex), by lapses, by perseveration (in the reaction to the word following the one which arouses the complex), occasionally by repetition of the word, or by peculiar indirect associations in which the following first word is mistaken in the sense of the complex: Mitleid-arm; gelb-(geld, referring to 'arm')-viel. Excellent instances of this type are given on pp. 204-214, 284-288, and Vol. IV., pp. 41-43; an excellent instance of indirect association, Vol. IV., pp. 50-51.

(b) A type in which the first word recalls an individual memory of some fact of daily life — simple constellation type.

(c) The egocentric form of the predicate type which reacts with an attribute of the first word.

No fundamental difference could be established between the sexes. For women the inner associations were slightly more prevalent, and the influence of distraction less readily obtained; especially the indirect associations are very rare.

The change of each association type under the influence of distraction is fully discussed, also the remarkable resistiveness of the characterologically most interesting and fundamental predicate-type (with its large number of egocentric reactions and relatively large number of lapses).

The influence of the grammatical form of the stimulus-word on the reaction is rather striking. Verbs seem to call for nouns in all the groups except the male attendants who search for a similar verb; most of the reactions are inner associations. The adjectives have a similar influence on the type of reaction. The predicate-type reacts to verbs largely with nouns, all the non-predicate types react with twice as many verbs to verbs, but in all the internal associations to verbs are 16-17 per cent. above the general average of internal associations. The predicate-type associates even more nouns than adjectives with adjectives; in the non-predicate types the adjectives are very numerous.

Of the practical application of this method of association studies, there are already some studies by K. Wehrin, Jung and Riklin, on idiocy and imbecility, on epilepsy and on hysteria; and there is a large material on dementia præcox in preparation. It is difficult to say whether the method will need much transformation to be as efficient as possible in psychopathology. Even in the present form, it is a great step towards systematic objectivity in a field in which impressionism has so far been considered as sufficient as the color of the con-

junctiva as a measure of anæmia before the study of a drop of blood had become a matter of routine.

From all that can be seen so far from this method of study, it would seem to be destined to form a very essential link between the excessively quantitative tendencies of a great deal of laboratory psychology and the excessive tendency to measure symptoms in mental disease merely by the anomaly or absurdity of the content. It studies strings of activities and opens a more optimistic outlook for the analysis of developments and characterization of diseases from what is going on. It aims to specify the permanent determining factors in the course of the psychological chain, and puts at our disposal concrete data which are bound to be better material of study than the impressions on which the alienist has to depend to-day. It brings us nearer a conception of the actual multiplicity of psychic activities, and whether or not Breuer and Freud's theory is going to play the important rôle which Jung and Riklin's studies point to in many places, the concrete experiences will, nevertheless, do a great deal to eradicate much of the mysteriousness of the activity of 'sub-conscious' undercurrents. We have reason to hope that a certain pessimistic attitude concerning scientific penetration into psychological analyses will be dispelled, and that the aversion to psychological analyses shown by Kraepelin's school in its fatalistic hypothetical conception of disease-entities will no longer be forced to ascribe to any such attempt an inevitable fault of character, such as I referred to in Vol. I., page 237, of this BULLETIN.

A. M.

*Ueber die Assoziationen von Imbecillen und Idioten.* K. WEHR-  
LIN. Journ. f. Psychol. u. Neurologie, Vol. IV., pp. 109-  
123, 129-143.

Wehrlin reviews first the study of Wreschner, who had worked with Sommer's scheme and found prevalence of adjectives, poor quality of associations and prolongations of reaction-time, open to improvement by practice. Sommer emphasizes the poverty of scope of associations. Fuhrman found idiots unable to produce subordinated and subordinating concepts.

The examination of 13 cases, 17-68 years old, is reported with examples of each case. Wehrlin found a great prevalence of replies with a sentence, or at least several words (school-habit, or assumption that the word implied a question), with a tendency to definitions; instead of the direct utterance of the first word presenting itself, the patient speaks from a construed constellation.

The definition is in its simplest form a tautological statement (cat—

kitten; mountain — the high mountain), or a formal statement (prison — consists of cells where one locks up useless people), or the word is subordinated to a wider concept, either appropriately (cat — domestic animal; table — furniture), or insufficiently (head — part, tree — thing, father — a man), or the too general term is made more definite by a term expressing place or purpose (cherry — garden thing; star — celestial part). Or the definition is an expression of time, place, means, end, origin, etc. (book — to read), or it gives the chief quality or activity (bird — flies). If the first word is an adjective or verb, the second word is usually illustrative (swim — the fish swims; blue — the sky). Examples, of a more or less general or more special, especially subjective nature, are illustrated by: sick — I have been sick; pay — that is when you work in a mill. Beside this formal aspect, the results of Wehrlin's test show intrinsic limitation of thought, often enough of a ludicrous character.

A. M.

*Analyse der Assoziationen eines Epileptikers.* C. G. JUNG.  
Journ. f. Psychol. u. Neurol., Vol. V., pp. 73-90.

The epileptic character shows:

1. Intellectual dementia, slowness of psychic reaction, circumstantiality, reduction and poverty of range of ideation, poverty and stereotypy of speech, and frequently abnormal prevalence of imagination; and

2. Emotional irritability, moodiness, marked egocentric effusiveness of all intellectual feelings, especially religiosity.

These traits are usually much less developed in cases with few attacks. Hence the efforts of Colucci and Breukink to determine special ergographic curves, and Fuhrmann's test with associations. Fuhrmann noted prevalence of predicative association and of the egocentric factors; moreover, especially in the beginning of tests, random association. (The latter occur in all defectives in a state of 'emotional stupidity' or perplexity.) In his second case, with four repetitions of the tests within eight months, there was marked limitation of the scope of association and monotony of reaction. Comparative tests in two idiots showed that the latter had no supraordinated (collective) notions. (Wehrlin found them at least primitive in idiots.)

Riklin established in epileptics perseveration in content of reaction and in grammatical form, marked egocentricity, personal constellations, frequent emotional guidance of the reactions and poverty of scope of ideas.

Jung and Ulrich have studied 158 epileptics with 18,277 reactions. Every test is preceded by some instructions, that a word would be

called out and that the subject should reply at once, without any meditation, with the first word or idea. It is especially necessary to put the patient at ease, and to dispel the emotional stupidity, or any strained effort to limit the type of reply to one word or any special kind of response: each subject should be allowed to find the most natural form. The list of words used consists of 75 concrete and 25 general nouns, 50 adjectives and 50 verbs, in the sequence: noun — adjective, noun — verb.

The present report is a complete analysis of one typical case, free of idiocy or imbecility: normal development and efficiency as a mechanic until his wife developed a psychosis and died, when he was thirty years old. Then transformation of character, tramp-life, thefts, alcoholism, delirious episodes, absences; few convulsions. Jung gives in full the account of 65 consecutive associations with time-measurement and interweaves his interpretations.

He sums up his results as follows:

I. Traits in common with the associations of the normal:

(a) The patient adjusts himself to the meaning of the first word, as the uneducated subjects generally do; consequently there are no superficial associations.

(b) The associations are partly determined by a constellation of a morbid complex.

II. Traits in common with the associations of imbeciles.

(a) The adjustment to the meaning of the first word is so intense that a large number of the associations must be explained as 'explanations' in the sense of Wehrlin;

(b) The associations have the form of a sentence;

(c) The reaction times are considerably lengthened as compared to the normal;

(d) The frequent repetition of the first word.

III. Peculiarities different from the normal or the imbecile.

(a) The 'explanation' or definitions have a remarkably clumsy and circumstantial character, which shows especially in the tendency to corroborations and additions to the reaction. The first word is often repeated within the reaction;

(b) The external form of the reaction is not stereotyped or limited, with the exception that the *egocentric* formulation is especially frequent (31 per cent.);

(c) Frequent emotional relations which are but slightly covered up (religious moralizing, etc.);

(d) The reaction times vary most *after* the critical reaction. The



abnormally long times are therefore not found with specially difficult words, but in places which are determined by a persevering emotional tone. One might, therefore, infer that in this subject the emotional tone asserts itself probably later and more strongly, and longer than in the normal.

There are, however, many forms of epilepsy, and Jung ascribes to this statement hardly more than casuistic value. A. M.

*Ueber die diagnostische Bedeutung von Assoziationsversuchungen bei Hysterischen.* F. RIKLIN. Centralbl. f. Nervenheilkunde u. Psychiatrie, August 15, 1904, pp. 554-556.

In this brief review, Riklin starts from certain reaction-types in the normal, the type with an open complex of strong emotional value (associations tending to feed on an emotional experience), the type with plainly displaced or dissociated complexes, and the type with merely slight retardations of reactions. The types with a dissociated complex in the sense of Breuer and Freud, is marked by the use of quotations, of the definite article in the reaction, reaction in the form of a sentence, perseveration of a concept once roused, assimilations of the stimulus in the sense of the complex, conscious or unconscious misunderstanding of the stimulus, frequent repetition of the same reaction in one sitting, occurrence of lapses or absence of all verbal reaction, and mimic reactions (flushing, pallor, laughing, crying, movements, low response to certain words), and especially slowness of the reaction, sufficient to rouse suspicion in otherwise apparently trivial responses. The hysterical type is an exaggeration of the type with a dissociated complex; it shows more complete gaps (lack of all verbal reaction), prolonged reaction times, more sentences, quotations, perseverations, mimic reactions, and much more reactions pointing to undercurrents. The complexes are more independent, and, as patients said, act as the small soul in the large one poisoning it when it awakes, or the personified evil spirit, much more personal, apt to usurp a motility of its own, etc. A. M.

*Analytische Untersuchungen der Symptome und Associationen eines Falles von Hysteria (Lina H.).* FRANZ RIKLIN. Psychiatrisch-neurolog. Wochenschrift, No. 46-52, 1905.

Riklin has subjected a case of hysteria with preëminently physical symptoms to a searching analysis following the method of Breuer and Freud.

The patient, born 1876, is the daughter of an alcoholic, guilty of repeated incest with the two sisters of the patient and the patient her-

self. About the age of twelve she was in a hospital with an hysterical heart-disorder; she also had attacks of hysterical rigidity. At seventeen she had an illegitimate child, another one at twenty (during the second pregnancy her father attempted incest); after that she served in hotels and frequently prostituted herself; a third child was born October, 1897, in the woods and died for lack of care; the patient served one year in the work-house, considered guilty of the child's death. A society for discharged female criminals provided a place for her; she worked well but soon became depressed, had ideas of suicide, and was committed March, 1899. She was a rather striking person, delicate, pale, with a certain refinement, not very bright, but without symptoms of imbecility. She coughed occasionally without any objective cause or bacilli in the sputum; she complained of ovarian pain and had slight retroflexion and retroposition of the uterus (1900); she had prolonged attacks of vomiting, and, 1903, hyperacidity of the gastric contents during a period of anorexia. In contrast with these scanty objective data there was a flood of subjective complaints: great fluctuations of elation and depression and moroseness; pains in the side, sleeplessness, inappetence, with craving for therapeutic attentions; between the exacerbations she worked well, and was jolly, only to relapse again. Especially at the time of menstruation, she demanded to be discharged, and to get all kinds of attentions.

She was successfully hypnotized on account of insomnia; she showed amnesia and fine post-hypnotic effects. The analysis was begun spring, 1903, during a prolonged hypochondriacal exacerbation following a dance. Riklin succeeded in tracing the individual symptoms to the sadly rich fund of experiences in her sexual life made accessible by hypnosis, while in the wake condition she had merely trivial explanations.

In examining such a symptom as her frequent vomiting, Riklin would first get at some of the more recent determining causes, but finally, after much resistance, crying and reaction of shame, elicit the more fundamental and otherwise 'forgotten' episodes. After such a reaction the symptom would disappear. The vomiting would come in attacks, at times to an alarming extent, resisting all efforts, but leading to remarkably little loss of weight. It was possible to show that the attacks were not infrequently the sequel of masturbation, when she thought simultaneously of definite individuals and connected it with a feeling of disgust. After a visit by her father, she began to dream of the incest and would become morose and vomit. Her distaste for milk was traced to an unsavory episode in a stable at the age

of about eleven. She gave a partial account in a first hypnosis, and was much worse for a week after it; then, in a second hypnosis, she gave a complete account of the happenings (contamination of the milk during an assault by a cousin), and after that she drank milk freely and never vomited from it. A distaste for meat was accounted for by successive strata of reminiscences of a similar nature; first by her having got bad meat one day, then that she took care of a patient with venereal sores that day and thought, without reason, that the meat had a bad odor; finally she related an exhibition scene that had taken place during a lunch, which she associated more definitely with eating meat. Later the patient again relapsed one day, and asked for eggs instead of meat; disappointed over not being visited by her sister, she recalled a visit by the father in torn clothes, and that had suggested the exhibition, and thus revived the disgust of meat. Since the hypnosis which brought out this explanation there has not been any relapse. The pains in the chest, certain attacks of pain in the back with vomiting, etc., a period of abasia, pain in the right arm, heart symptoms, were traced superficially to masturbation, and finally to certain events connected with an abortion. Attacks of ear and headache had their link — unappreciated by her wake consciousness — in a jacket she would wear on cold days and which she had worn when she gave birth to her third child in the woods, and actually had earache. She would explain the pain by the cold weather, but it was easy to show that the jacket was the eliciting factor of this recurrence of symptoms.

Menstruation would be most apt to bring about relapses and new traits of displaced concepts, of which the original gives many interesting examples.

As a sample of new symptoms I merely mention — pain in the heel when she ran away from a nurse in fun and the latter twitted her on some love-affair, or even better, pain in the hip when a nurse, who had her arm around her waist and hip, made some sexual allusion. The patient had evidently used the mechanism of dissociation and 'conversion' for most unpleasant events since the age of ten. Notwithstanding slight subjective effort to get better, the patient improved lastingly and considerably, and might have been discharged but for fear of her moral instability.

In the general part, Riklin furnishes some evidence of the veracity concerning the various sexual traumatismes and other events. He considers the control sufficient to exclude pseudologia. There were no contradictions.

The exhaustion of the wide range of symptoms and traumatisms took an enormous amount of time in this patient. In others, in more casual than constitutional forms, the method is much more directly beneficial.

The principle is that some emotional (frequently sexual) traumatism is suppressed, never thoroughly reacted to or disposed of; the topic becomes split off, and replaced by or converted into the various symptoms of disgust for certain foods, pains, and other physical and mental symptoms, in this case largely physical complaints. Usually the patient is no longer aware of the connection of such symptoms with a dissociated complex; she gives superficial and erroneous explanations in her wake state. The affective attitude of the patient concerning what is being disclosed by search, is peculiarly inadequate, a fact that causes numerous difficulties in the examinations of such patients. Riklin quotes the case of a boy of five who had gone through a nocturnal delirium, and the next day spoke freely about the toys, etc., but affected sleepiness or asked for books or water when he was questioned about the night. Lina H. often remarked she had no time to think further, became distracted, and indifferent as to the partially recovered data; at times she strongly resisted further inquiry with the force of a catatonic negativism, even after a change of expression had passed over her face such as usually indicated the reacquisition of a new point. An incomplete 'reaction' would occasionally aggravate the patient's condition; resistance (in the form of indifference, etc.), would greatly delay the inquiry; only the complete reaction (*i. e.*, recapitulation and true emotional reaction to the event of the traumatism) would bring lasting relief.

Of late Freud has developed a method of analysis in the wake-state, following principles laid down in his work on the interpretation of dreams and interpretation of forgetfulness and slips of speech, etc.

Riklin next shows how *association tests* furnish excellent material for the discovery of undercurrents and, indeed, a conception of the phenomena of conversion and hysteria generally which promises fair to throw more light on all the psychogenous disorders, and even dementia præcox. Sets of associations with notation of reaction-time and other peculiarities were taken in the wake-state and in hypnosis and compared.

Referring to his communication concerning the diagnostic importance of association-tests in the hysterical (see p. 253), he furnishes excellent illustrations of the frustration or retardation of associations wherever an undercurrent complex was evoked. To 5 out of 100

words, the patient could not find any association, would claim that she could not understand, or be surprised that she had no thoughts, but in hypnosis the traumatic complex could be found: To 'lang' she found no word, and finally in hypnosis 'langsam,' a mere superficial addition — because she had lately read of a painter Lang who reminded her strongly of her first love-affair with a painter and a number of 'traumatic complexes.' To 'bö's' (disagreeable) she had been on the point of associating 'artig' (pleasant), but the word slipped away and she had to think how disagreeable and irritable she had been for some time (during an exacerbation). This is a phenomenon of wide importance in psychopathology, the blocking of ideas analogous to the much more radical 'loss or withdrawal of thoughts' of dementia præcox which one of Jung's patients described by the word 'Gedankenentzug' which seems to be so descriptive that such a patient understands it at once as well as one with hallucinations understands the inquiry for 'voices.'

In a great number of reactions, the patient showed retardation (a symptom falling short of complete absence of reaction, but pointing to an obstacle). Not infrequently she gave a fairly quick but trivial association in waking, and a retarded one in hypnosis, with some definite blocking complex at bottom. In other instances associations are indirect with oblivion of the link (analogous to the replacing of a reminiscence by ear-ache owing to association by a link of original coexistence, or some similarity); the verbal reaction appears in form of a quotation, or of a sentence, or a sound association, or a so-called mimic reaction, such as laughing, crying, trembling, pallor, unrest, brilliancy of the eyes, change of expression, all apt to point to split-off undercurrents. Instances are given from this and other cases.

The whole experience with hysteria leads Riklin to replace the somewhat artificial 'short-circuit' simile of Breuer and Freud, the discharge of the original affect in an abnormal *reflex* instead of the normal reaction, and the return of the abnormal reflex by every reminiscence which would touch on the affective complex. In L. R., the smell of burned flour happened to exist when the complex occurred which was later displaced; this odor would be revived by what would normally have revived the displaced complex. The vomiting, the ear-ache, etc., in Lina H. are similarly determined by their original coexistence. Breuer and Freud would think of a conversion of a psychic excitation into an abnormal physical reflex, whereas Riklin would replace the idea by viewing the available data from the point of view of association.



Even in the normal Riklin and Jung have found the existence of inhibitory complexes. The traumatic complexes of the hysterical become automatic complexes, split-off from consciousness owing to incompatibility and consisting of the concept and its affect. When aroused, only part of the complex becomes conscious, and is then felt as independent, not in its true connection, but with plausibly invented explanations, which do not really explain why the patient should be so upset. An hysterical patient claimed to be driven to suicidal thought by a chilly sensation in her lower extremities. This serious reaction became intelligible through the connection of this symptom with a gynecological examination, thought of sterility, marital indifference, etc. In such instances the affect itself is not converted and remains active. In other instances the affect is quite altered, as in the case of an hysterical student whose lover had shot himself in the temple, and who laughingly associated the indifferent word *Gummischuhe* with the word 'putzen' (rub off), while the word suddenly reminded her of the blood on the temple, or who in order to play pranks on the physician would be led to suddenly pop a rose-leaf on his temple. In other instances the touch of the undercurrent would merely lead to 'withdrawal of thought' with the appearance of indifference or distraction. In all these conditions, the dissociated complex acts as an automatism. Its conscious ventilation takes away the automatic nature, and subjects the topic to the 'Usur' or wearing off or assimilation of experience. To react in presence of another person seems to mean more, as in the relief afforded by communication of non-dissociated experiences in personal confession, etc.

Since the dissociated complexes reach the surface merely through trivial associations of coexistence, similarities of the loosest character, Riklin describes them as surrounded by a shell of such superficial concepts; stimulation of the undercurrent rouses merely this surface, deceiving even the patient; the faulty connections become habitual and often difficult to eradicate; hence the dependence of the prognosis on the age and habituation of the symptoms, and the formulation of a fundamental feature of hysteria: dissociation and automatic, independent activity of the dissociated complexes. From this view-point Riklin creates definitions of a number of clinical types of hysteria:

1. Hysteria with physical symptoms (conversion-symptoms): the complex is dissociated and replaced by the superficially associated physical symptoms and symptomatic acts. Association tests furnish an abundance of such superficial connections.

2. Imperative neuroses (*Zwangsneurosen*) show a similar splitting



off, with persistence of the affect. The associative complexes are much more closely related to the fundamental trauma, more painful, and their consequences more serious.

3. Hysterical dreamy states with delusions of fulfilment of the very opposite of the calamity of the fundamental complex. These and other hysterical deliria are usually elicited by something touching the sore point; they are usually followed by amnesia.

4. In dreamy states with Ganser's complex, an attitude of ignorance (or of the characteristic hysterical indifference?), such as is so often seen in reference to the dissociated complex, even spreads over facts which have nothing to do with the complex; the patient gives absurd answers to the simplest questions.

5. In trances, the dissociated complexes may be developed into complete secondary personalities (Flournoy's patient with the personality from Mars).

6. In pathological hypnosis it is difficult to control suggestions which have a relation to the undercurrent, both with regard to giving the suggestion at all, and with regard to controlling its effects.

In the abasia of fright-neuroses the dissociation of complex and symptoms may not be so complete as in the above 'hysteria with physical symptoms.' Hence the frequent gradual correction.

Riklin also promises outlooks towards a psychopathological analysis of graver psychoses, such as dementia præcox.

Two charts of reaction-types of the normal and the hysterical patient accompany the very instructive study. A. M.

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#### BOOKS RECEIVED FROM JUNE 5 TO JULY 5.

*The Approach to Philosophy.* RALPH BARTON PERRY. New York, Charles Scribner's Sons, 1905. Pp. xxiv + 448.

*Science and a Future Life.* JAMES H. HYSLOP. Boston, Herbert B. Turner and Co., 1903. Pp. x + 369.

*Manual of Psychiatry.* J. ROGUES DE FURSAC. Trans. by A. J. ROSANOFF. Ed. by JOSEPH COLLINS. New York, John Wiley & Sons; London, Chapman & Hall, 1905. Pp. xii + 352. \$2.50.

*Psychiatry: A Text-book for Students and Physicians.* STEWART PATON. Philadelphia & London, Lippincott, 1905. Pp. xii + 618. \$4.00.

## NOTES AND NEWS.

DR. H. W. STUART has been elected to the chair of philosophy in Lake Forest University to succeed Professor Smith, whose resignation was due to illness.

DR. AUGUST HOCH, of McLean Hospital, Waverley, Mass., has taken the position of First Assistant at the Bloomington Asylum, White Plains, N. Y.

THE following have been appointed preceptors in philosophy in Princeton University under the new tutorial system: Roger B. C. Johnson, of Miami University; Wilmon Henry Sheldon and Adam Leroy Jones, of Columbia University; Walter T. Marvin, of Adelbert College; and Edward G. Spaulding, of the College of the City of New York.

PROFESSOR HUGO MÜNSTERBERG has gone abroad for the summer, to return to America about the middle of September. His new book, 'The Eternal Life,' is being brought out in England.

A SPECIAL summer meeting of the American Anthropological Association will be held in San Francisco on August 29 to 31. After the meeting there will be an excursion to Portland, Oregon, to visit the Lewis and Clark Exposition. Here an informal meeting will be held, at which addresses will be made. Members intending to be present are requested to notify the Secretary of the Local Committee, Dr. A. L. Kroeber, Affiliated Colleges, San Francisco. Mr. G. G. MacCurdy, Secretary of the Association (237 Church street, New Haven, Conn.), will give information as to special railroad rates.

